

Attorney Docket: 008895-0314113
Client Reference: WIT/P59326US00

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re application of: GOSSE BOXHOORN, ET AL.

Application No.: 10/518,695

Group No.: 1795

Filed: September 20, 2005

Examiner: McDonald, Rodney G.

Title: METHOD AND APPARATUS FOR MANUFACTURING A CATALYST

SUPPLEMENTAL APPEAL BRIEF

Mail Stop Appeal Brief - Patents

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Appeal is from the Final Office Action mailed November 20, 2008, rejecting claims 51-83 of the above-identified patent application. This brief is in furtherance of the Notice of Appeal and the Pre-Appeal Brief Request both filed February 19, 2009. The Panel Decision from the Pre-Appeal Brief Review, mailed March 20, 2009, indicated that the application remains under appeal because there is at least one issue for appeal.

The Director is hereby authorized to charge the \$540.00 fee for filing an Appeal Brief pursuant to 37 C.F.R. § 41.20(b)(2). The Director is further authorized to charge any additional fees that may be due, or credit any overpayment of same to Deposit Account No. 033975 (**Ref. No. 008895-0314113**).

REQUIREMENTS OF 37 C.F.R. § 41.37

I. REAL PARTIES IN INTEREST (37 C.F.R. § 1.192(c)(1)(i))

The real party in interest in this appeal is the following party: OTB Group B.V. (Netherlands), by way of an Assignment recorded September 20, 2005, in the U.S. Patent and Trademark Office at Reel 017504, Frame 0626.

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 1.192(c)(1)(ii))

Appellant is unaware of any related appeals and/or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS (37 C.F.R. § 1.192(c)(1)(iii))

Pending: Claims 34-83 are pending.

Withdrawn: Claims 34-50 have been withdrawn.

Canceled: Claims 1-33 are canceled.

Rejected: Claims 51-83 stand rejected.

Objected: No claims have been objected.

Allowed: No claims have been allowed.

On Appeal: The rejections of claims 51-83 are appealed.

IV. STATUS OF AMENDMENTS (37 C.F.R. § 1.192(c)(1)(iv))

No amendments have been filed subsequent to the Final Office Action mailed November 20, 2008 (hereafter "Office Action").

V. SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. § 1.192(c)(1)(v))

The following explanation of the claimed subject matter, with reference to the specification and drawings, is for explanation only and is not to be construed, in any way, as an admission that the claims are limited to the particularly disclosed embodiments. Rather, such description is intended to facilitate an understanding of the claims by the Board and is absolutely not intended to operate a comprehensive claim construction. The invention is not limited to the disclosed embodiments. References to the specification and drawings are examples; other parts or elements of the specification and drawings may be applicable.

A. Independent Claims on Appeal

1. Claim 51

The invention of claim 51 concerns a method for manufacturing a mixed layer catalyst. The method includes: providing a processing chamber (2) with at least one plasma cascade source (3); introducing a substrate (1) into the processing chamber (3); generating at least one plasma (P) with the at least one plasma cascade source (3); introducing a first deposition material (A) in the plasma; depositing the first deposition material on the substrate under the influence of the plasma; providing at least one sputtering electrode (6) that comprises a second deposition material (B) and that is

arranged in the processing chamber; and contacting the plasma with the at least one sputtering electrode (6) to sputter the substrate with the second deposition material of the at least one electrode for depositing the second deposition material simultaneously with the first deposition material on the substrate. [See page 20, lines 1-5 and 11-18].

VI. GROUNDINGS OF REJECTION TO BE REVIEWED ON APPEAL

(37 C.F.R. § 41.37(c)(1)(vi))

Appellant is appealing:

1.). The rejection of claims 51-55, 57, 66, 68, 71, 77, 79, 80, 81, 82 and 83 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. 4,871,580 to Schram *et al.* ("Schram") in view of U.S. 5,559,065 to Lauth *et al.* ("Lauth").

2.) The rejection of claims 56, 58, 59, 63, 64, 65, 70, 72 and 73 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Schram and Lauth and further in view of Canadian Patent Application Publication No. CA 2,297,543 to Loch *et al.* ("Loch").

3.). The rejection of claims 74-76 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Schram, Lauth and Loch and further in view of U.S. Patent No. 4,536,482 to Carcia ("Carcia").

4.). The rejection of claims 60-62, 67 and 78 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Schram and Lauth and further in view of Carcia; and

5). The rejection of claims 69 and 70 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Schram, in view of Lauth, and further in view of U.S. Patent No.3,969,082 to Cairns *et al.* ("Cairns").

VII. ARGUMENT (37 C.F.R. § 41.37(c)(1)(vii))

1. **The rejection of claims 51-55, 57, 66, 68, 71, 77, 79, 80, 81, 82 and 83 under 35 U.S.C. § 103(a) over Schram in view of Lauth.**

35 U.S.C. § 103(a) provides:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Office to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Office must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). Indeed, "the examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). "[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR Int'l Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396 (2007) (*citing United States v. Adams*, 383 U.S. 39 (1966)). Rather, "....there must be some articulated reasoning with some rational underpinning to support the legal conclusion of

obviousness'...[H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." KSR, 82 USPQ2d at 1396 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Claim 51

Independent claim 51 recites a method for manufacturing a mixed layer comprising, *inter alia*, the features of:

introducing ***a first deposition material*** in the plasma;
depositing the ***first deposition material on the substrate*** under the influence of the plasma;

* * *

contacting the plasma with the at least one sputtering electrode to sputter the substrate with the second deposition material of the at least one electrode for depositing ***the second deposition material simultaneously with the first deposition material on the substrate.***

[Emphasis added].

Neither Schram nor Lauth, either alone or in combination, teach or otherwise render obvious *at least* the above-emphasized features of independent claim 51.

A. **Schram and Lauth do not teach or otherwise render obvious first and second deposition materials, nor simultaneously depositing first and second deposition materials on a substrate.**

The Office Action asserts that Schram teaches depositing first and second deposition materials on a substrate. [See Office action, pg. 3]. However, the passages of Schram, which the Office Action refers to as allegedly teaching "a first deposition

material" (i.e., Abstract, column 4, lines 64-68; column 5, lines 1-12), merely disclose a plasma generator 13 which is fed with liquid or gas-like reactants via inlet 11 and a flushing gas fed via inlet 12 to produce a plasma-jet 8.

The descriptions of the liquid and gas-like reactants and the flushing gas in Schram are notably silent as to whether these substances form a deposition material on the substrate 9. [See, e.g., Schram, col. 4, line 68 – col. 5 line 12]. Rather, it is the solid matter reactant of the sputtering electrode (i.e., cathode 6) that is made gas-like by sputtering and mixes with the plasma jet that appears to form the only deposition material on the substrate 9. [See Schram, col. 6, lines 61-65; col. 5, lines 34-38; claim 11]. As such, the cited portions of Schram do not teach or disclose introducing a first deposition material in the plasma (separate from the material deposited by sputtering), much less simultaneously depositing first and second deposition materials on a substrate, as claim 51 recites.

Further, even assuming, *arguendo*, that it was proper to combine the teachings of Schram and Lauth (which Appellant does not concede), Appellant submits that the cited portions of Lauth do not overcome the deficiencies of Schram.

In particular, Lauth discloses forming coated catalysts by depositing an alloy by physical vapor deposition and/or chemical vapor deposition on a molding. The materials to be coated are applied in solid form as a target to the cathode of the plasma system. [See Lauth, col. 2, lines 27-32]. However, Lauth appears to disclose depositing a only *single catalyst material*, such as $\text{Pd}_{33}\text{Zr}_{66}$ (Examples 1 and 2), or $\text{Cu}_{70}\text{Zr}_{30}$ (Example 4) onto a molding by sputtering one or more targets. [See *a/so* Lauth, Table; Abstract]. As such, Lauth does not teach or disclose introducing a first deposition

material in the plasma (separate from material(s) deposited by sputtering), let alone simultaneously depositing first and second deposition materials on a substrate, as claim 51 recites.

For *at least* the foregoing reasons, the cited portions of Schram and/or Lauth do not teach or otherwise render obvious first and second deposition materials, nor simultaneously depositing first and second deposition materials onto a substrate. Accordingly, independent claim 51 is patentable over Schram and/or Lauth.

B. Schram and Lauth do not teach or otherwise render contacting the plasma with the at least one sputtering electrode to sputter the substrate with the second deposition material of the at least one electrode.

The Office Action asserts that Schram teaches "[d]epositing at least a second deposition material on the substrate by at least a sputtering source." [Office Action, pg. 3]. Appellant submits that this treatment of claim 51 is improper as it clearly ignores the plain language of the claims.¹

Claim 51 does not merely recite sputtering, *per se*, but rather "contacting the plasma with the at least one sputtering electrode to sputter the substrate with the second deposition material of the at least one electrode for depositing the second deposition material simultaneously with the first deposition material on the substrate."

The Office fails to show how the cited portions of Schram and/or Lauth allegedly teach these features. This is improper. "When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not

¹ "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

apparent, must be clearly explained and each rejected claim specified.” 37 C.F.R. 1.104(c)(2). The plain fact of the matter is that Schram contains absolutely no teachings or suggestion of contacting the plasma with the at least one sputtering electrode to sputter the substrate with the deposition material.

Appellant further submits that the Office Action’s contention that “... Fig. 1 of [Appellant’s] disclosure is identical to or similar to Schram et al.’s apparatus and achieves the same affect [*sic*] that [Appellant] desires,” is manifestly erroneous. [Office Action, pg. 11].

First, Appellant submits that whether a reference’s figures look alike or similar to those disclosed by Appellant is not the proper standard of patentability. Rather, the proper inquiry must focus on the claimed invention.

Second, Figure 1 of Schram does not show what the Office asserts. In fact, Figure 1 of Schram (reproduced below) shows that the plasma-jet 8 does not contact the sputtering electrode, i.e., cathode 6. Instead, Schram discloses that the reactant material of the cathode 6 (51) is made gas-like by **applying a discharge voltage to the cathode**. [See Schram, col.5, lines 33-38 & col. 6, lines 61-65]. And it is only after the reactant material has been freed from the cathode 6 by the sputtering discharge that the reactant material *mixes* with the plasma-jet 8. [See Schram, col. 6, lines 61-65; col. 5, lines 34-38]. As such, there is no indication or suggestion in Schram that the plasma-jet 8 contacts the sputtering electrode 6. In addition, as pointed out above, Schram does not teach first and second deposition materials, much less simultaneously depositing both on the substrate.

To facilitate the Board's understanding some of the differences between the present invention and Schram, reference may be made to Figure 1 of the Appellant's Specification and Figure 1 of Schram. Figure 1 of Appellant's application (reproduced below on the right) shows the plasma-jet P contacting the sputtering electrode 6. It is the plasma jet physically contacting the sputtering electrode 6 which releases the electrode material B from the sputtering electrode 6. [See Appellant's Specification, pg. 20, lines 1-3]. Thus, both a first deposition material A in the plasma-jet P and a second deposition material B from the sputtering electrode 6 may be simultaneously deposited on a substrate in a very uniform manner and a high deposition rate can be achieved. [See Appellant's Specification, pg. 20, lines 16-22]. That is not the case with Schram, which contains no disclosure (or even illustration) whatsoever, of a plasma jet contacting the sputtering electrode.

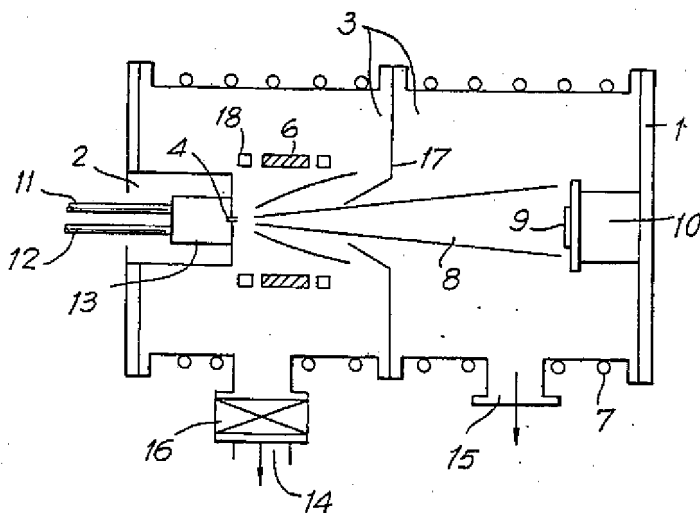


FIG. 1 of Schram

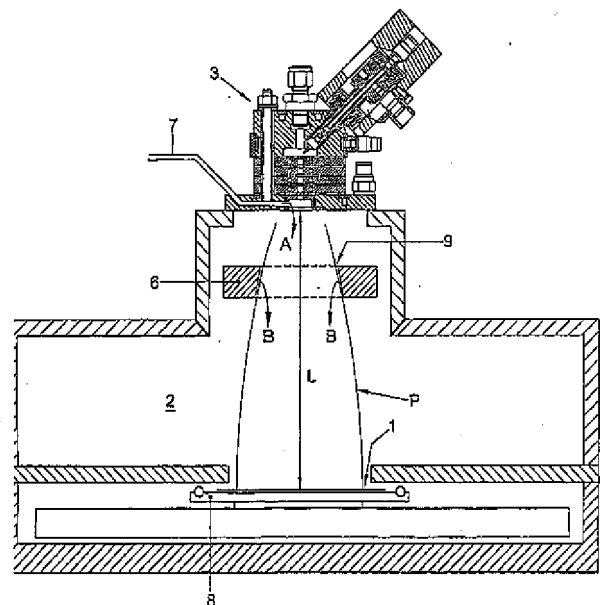


FIG. 1 of Appellant

Therefore, Appellant submits that the Office's conclusion the apparatus of Schram and the one claimed by Appellant are identical or similar is manifestly erroneous.

Lauth does not overcome the deficiencies of Schram, either. For example, Lauth merely notes that the deposition materials may be coated using DC or RF sputtering "in a conventional manner by DC or RF generators." [Lauth, col. 2, lines 27-41]. However, the cited portions of Lauth (like the cited portions of Schram) do not teach contacting the plasma with the at least one sputtering electrode to sputter the substrate with the (second) deposition material of the at least one electrode.

Accordingly, the cited portions of Schram and Lauth do not teach or otherwise render obvious "contacting the plasma with the at least one sputtering electrode to sputter the substrate." Accordingly, independent claim 51 is patentable over Schram, Lauth or a proper combination thereof.

Thus, Appellant submits that a *prima facie* case of obviousness has not been established and that the cited portions of Schram, Lauth, or a proper combination thereof fail to disclose or render obvious each and every feature recited by claim 51. Claims 52-55, 57, 66, 68, 71, 77, 79, 80, 81, 82 and 83 depend from claim 51 and are patentable for at least the same reasons provided above related to claim 51, and for the additional features recited therein.

Claims 53 - 55

Claim 53 further recites "supplying the first deposition material outside the at least one plasma source into the processing chamber to the plasma in the processing chamber." And claim 54 further recites "supplying at least one volatile compound of the first deposition material to the plasma for the purpose of the deposition."

The Office Action asserts that column 4, line 64 – column 5, line 12 allegedly teach these feature. Appellant disagrees.

As discussed above, the cited portions of Schram do not teach "first deposition material in the plasma." Indeed, the descriptions of the liquid and gas-like reactants and the flushing gas in Schram are notably silent as to whether these substances form a deposition material on the substrate 9. [See, e.g., Schram, col. 4, line 68 – col. 5 line

12]. Rather, it is the solid matter reactant of the cathode 6 that is made gas-like by sputtering and mixes with the plasma jet that appears to form the only deposition material on the substrate 9 in Schram. [See Schram, col. 6, lines 61-65; col. 5, lines 34-38; claim 11].

As such, the cited portions of Schram and/or Lauth also fail to teach or disclose "supplying the first deposition material outside the at least one plasma source into the processing chamber to the plasma in the processing chamber," as recited in claim 53 and "supplying at least one volatile compound of the first deposition material to the plasma for the purpose of the deposition," as recited in claim 54. Claim 55 depend from claim 54 and is patentable for at least the same reasons provided above related to claim 54, and for the additional features recited therein.

* * *

For *at least* the foregoing reasons, Appellant respectfully submits that the rejection under 35 U.S.C. §103(a) of claims 51-55, 57, 66, 68, 71, 77, 79, 80, 81, 82 and 83 over Schram in view of Lauth is improper and should be withdrawn.

B. The rejection of claims 56, 58, 59, 63, 64, 65, 70, 72 and 73 under 35 U.S.C. § 103(a) over Schram in view of Lauth, and further in view of Loch.

Even assuming, *arguendo*, that it was proper to further combine the teachings of Schram, Lauth and Loch (which Appellant does not concede), the cited portions of Loch do not overcome the deficiencies of Schram and Lauth, discussed above.

The Office Action relies upon Loch to allegedly teach other dependent features of the claim invention (other than independent claim 51).

Without agreeing or acceding to the propriety of theses rejections, Appellant submits that claims 56, 58, 59, 63, 64, 65, 70, 72 and 73 are patentable for the same

reasons as independent claim 51 and for the additional features the claims recite individually.²

Claim 56

Claim 56 further recites "providing at least one second source chosen from the group consisting of a second plasma cascade source, a plasma source, a vapor deposition source and a sputtering source; and depositing a third deposition material on the substrate with the second source."

The Office Action asserts that page 5 of Loch allegedly teaches these features. In particular, the Office Action states: "In this instant hydrogen and nitrogen gas sources would be vapor deposition source." [Office Action, pg. 7]. Appellant disagrees.

The cited portions of Loch disclose supplying a working gas (i.e., mixture of argon, hydrogen, helium and/or nitrogen) to a *single* spray gun 200. [See also Loch, Figure 1]. Appellant submits that each of the gas supplying means is not a separate vapor deposition source, as the gases themselves do not provide for an additional (third) deposition material on the substrate. Rather, Loch discloses that it "is powder P, which is used as coating material." [Loch, pg. 5].

* * *

For *at least* the foregoing reasons, Appellant submits that a *prima facie* case of obviousness has not been established and that the cited portions of Schram, Lauth, Loch, or a proper combination thereof fail to disclose or render obvious each and every feature recited by claim 51. Claims 56, 58, 59, 63, 64, 65, 70, 72 and 73 depend from claim 51 and are patentable for at least the same reasons provided above related to claim 51, and for the additional features recited therein. As a result, Appellant respectfully submits that the rejection under 35 U.S.C. §103(a) of claims 56, 58, 59, 63, 64, 65, 70, 72 and 73 over Schram in view of Lauth and further in view of Loch is improper and should be withdrawn.

² If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending

C. The rejection of claims 74-76 under 35 U.S.C. § 103(a) over Schram in view of Lauth and Loch, and further in view of Carcia.

Even assuming, *arguendo*, that it was proper to further combine the teachings of Schram, Lauth, Loch and Carcia (which Appellant does not concede), the cited portions of Carcia do not overcome the deficiencies of Schram, Lauth and Loch, discussed above.

The Office Action relies upon Carcia to allegedly teach other dependent features of the claim invention (other than independent claim 51).

Without agreeing or acceding to the propriety of these rejections, Appellant submits that claims 74-76 are patentable for the same reasons as independent claim 51 and for the additional features the claims recite individually.

Thus, Appellant submits that a *prima facie* case of obviousness has not been established and that the cited portions of Schram, Lauth, Loch, Carcia, or a proper combination thereof fail to disclose or render obvious each and every feature recited by claim 51. Claims 74-76 depend from claim 51 and are patentable for at least the same reasons provided above related to claim 51, and for the additional features recited therein.

Claims 74 & 75

Claim 74 further recites "wherein said carrier material comprises a semiconductor." And claim 75 further recites "wherein said carrier material comprises an oxidized semiconductor."

The Office Action asserts that Column 2, lines 56-59 and 66-68 of Carcia allegedly teach this features. Appellant disagrees.

The cited passages of Carcia disclose that the catalyst substrate material may be a refractory material, e.g., oxides, nitrides and carbides, and that the sputtered film is formed of one or more catalytically active metal such as Pt, Pd, Ag, Au, Re, Rh, Ru and Ir and a cosputtered support material (preferably an oxide nitride or carbide and is the same material as the substrate material). [See *also* Carcia, col. 3, lines 1-6].

therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Yet nowhere do the cited portion of Carcia disclose a carrier material comprising a semiconductor, much less an oxidized semiconductor, as claims 74 and 75 recite.

* * *

For *at least* the foregoing reasons, Appellant respectfully submits that the rejection under 35 U.S.C. §103(a) of claims 74-76 over Schram in view of Lauth and Loch and further in view of Carcia is improper and should be withdrawn.

D. The rejection of claims 60-62, 67 and 78 under 35 U.S.C. § 103(a) over Schram in view of Lauth, and further in view of Carcia.

Even assuming, *arguendo*, that it was proper to further combine the teachings of Schram, Lauth and Carcia (which Appellant does not concede), the cited portions of Carcia do not overcome the deficiencies of Schram and Lauth, discussed above.

The Office Action relies upon Carcia to allegedly teach other dependent features of the claim invention (other than independent claim 51).

Without agreeing or acceding to the propriety of theses rejections, Appellant submits that claims 60-62, 67 and 78 are patentable for the same reasons as independent claim 51 and for the additional features the claims recite individually.

For *at least* the foregoing reasons, Appellant submits that a *prima facie* case of obviousness has not been established and that the cited portions of Schram, Lauth, Carcia, or a proper combination thereof fail to disclose or render obvious each and every feature recited by claim 51. Claims 60-62, 67 and 78 depend from claim 51 and are patentable for at least the same reasons provided above related to claim 51, and for the additional features recited therein. As a result, Appellant respectfully submits that the rejection under 35 U.S.C. §103(a) of claims 60-62, 67 and 78 over Schram in view of Lauth and further in view of Carcia is improper and should be withdrawn.

E. The rejection of claims 69 and 70 under 35 U.S.C. § 103(a) over Schram in view of Lauth, and further in view of Cairns.

Even assuming, *arguendo*, that it was proper to further combine the teachings of Schram, Lauth and Cairns (which Appellant does not concede), the cited portions of Cairns do not overcome the deficiencies of Schram and Lauth, discussed above.

The Office Action relies upon Cairns to allegedly teach other dependent features of the claim invention (other than independent claim 51).

Without agreeing or acceding to the propriety of these rejections, Appellant submits that claims 69 and 70 are patentable for the same reasons as independent claim 51 and for the additional features the claims recite individually.

For *at least* the foregoing reasons, Appellant submits that a *prima facie* case of obviousness has not been established and that the cited portions of Schram, Lauth, Cairns, or a proper combination thereof fail to disclose or render obvious each and every feature recited by claim 51. Claims 69 and 70 depend from claim 51 and are patentable for at least the same reasons provided above related to claim 51, and for the additional features recited therein. Thus, Appellant respectfully submits that the rejection under 35 U.S.C. §103(a) of claims 69 and 70 over Schram in view of Lauth and further in view of Cairns is improper and should be withdrawn.

VIII. CLAIMS APPENDIX (37 C.F.R. § 41.37(c)(1)(viii))

Appendix A: The pending claims (claims 34-83) are attached in Appendix A.

IX. EVIDENCE APPENDIX (37 C.F.R. § 41.37(c)(1)(ix))

Appendix B: (None)

X. RELATED PROCEEDING INDEX (37 C.F.R. § 41.37(c)(1)(x))

Appendix C: (None)

CONCLUSION

For at least the foregoing reasons, Appellant respectfully requests that the rejections of each of pending claims 51-83 be reversed.

Respectfully submitted,



Date: July 22, 2009

PILLSBURY WINTHROP SHAW PITTMAN LLP

P.O. Box 10500

McLean, VA 22102

Telephone: (703) 770.7721

Facsimile: (703) 770-7901

Customer Number: 00909

ERIC B. COMPTON

Registration No. 54,806

APPENDIX A

CLAIMS

1.-33. (Cancelled)

34. (Withdrawn) An apparatus for depositing a layer on a substrate, comprising:

at least one plasma cascade source to generate at least one plasma;

a first deposition material source configured to bring a first deposition material into each plasma;

a substrate positioner to bring and/or keep at least a part of a substrate in such a position in a processing chamber that the substrate makes contact with said plasma; and

a second plasma cascade source, a plasma source, a vapor deposition source and/or a sputtering source configured to deposit at least a second deposition material on the substrate.

35. (Withdrawn) An apparatus according to claim 34, wherein the first deposition material source comprises at least one sputtering electrode which contains deposition material to be deposited, wherein the sputtering electrode is positioned such that the plasma generated by the at least one plasma source during use sputters material from the sputtering electrode on the substrate.

36. (Withdrawn) An apparatus according to claim 35, wherein each sputtering electrode is arranged downstream of the at least one plasma source, and at least one sputtering electrode is provided with at least one plasma passage to allow the plasma to pass from the source to the substrate.

37. (Withdrawn) An apparatus according to claim 35, wherein the sputtering electrode lies against the source.

38. (Withdrawn) An apparatus according to claim 37, wherein the first deposition material source comprises at least one fluid supply channel to supply a material to be deposited, being in a volatile state, to the plasma.

39. (Withdrawn) An apparatus according to claim 38, wherein the at least one sputtering electrode is provided with said fluid supply channel.

40. (Withdrawn) An apparatus according to claim 34, wherein the apparatus is provided with at least two plasma cascade sources to generate at least two plasmas, wherein these plasma cascade sources and the substrate positioner are positioned such that opposite sides of the substrate during use make contact with the plasmas generated by the two plasma cascade sources to deposit material on the opposite sides of the substrate.

41. (Withdrawn) An apparatus according to claim 34, wherein the apparatus is provided with a substrate supply roller and a discharge roller, respectively, to supply and discharge, respectively, a substrate that can be rolled up, such as a web and/or sheet-like substrate, to and from the processing chamber, respectively.

42. (Withdrawn) An apparatus according to claim 34, wherein a wall of the processing chamber is provided with at least one passage to pass the substrate into and/or out of that chamber.

43. (Withdrawn) An apparatus according to claim 42, wherein at least a part of the at least one passage of the processing chamber wall is bounded by oppositely arranged feed-through rollers, and the feed-through rollers are arranged to engage a part of the substrate disposed between them during use, for the purpose of feed-through of the substrate.

44. (Withdrawn) An apparatus according to claim 41, wherein the apparatus is provided with a pair of rollers to deform the substrate which has unrolled from the supply roller.

45. (Withdrawn) An apparatus according to claim 44, wherein the pair of rollers are arranged to corrugate and/or serrate the substrate.

46. (Withdrawn) An apparatus according to claim 34, wherein the apparatus is provided with a vapor deposition apparatus to vapor deposit material on the substrate.

47. (Withdrawn) An apparatus according to claim 34, wherein the apparatus is provided with at least one separate sputtering source configured to sputter material on the substrate.

48. (Withdrawn) A catalyst provided with at least one carrier material and at least one catalyst material, the carrier material comprising an oxidic material, and the carrier material further comprising at least one heat conducting material.

49. (Withdrawn) A catalyst according to claim 48, wherein the heat-conducting material comprises carbon.

50. (Withdrawn) A catalyst manufactured according to the method of claim 1.

51. (Previously Presented) A method for manufacturing a mixed layer including:

- providing a processing chamber with at least one plasma cascade source;
- introducing a substrate into the processing chamber;
- generating at least one plasma with the at least one plasma cascade source;
- introducing a first deposition material in the plasma;
- depositing the first deposition material on the substrate under the influence of the plasma;

providing at least one sputtering electrode that comprises a second deposition material and that is arranged in the processing chamber; and

contacting the plasma with the at least one sputtering electrode to sputter the substrate with the second deposition material of the at least one electrode for depositing the second deposition material simultaneously with the first deposition material on the substrate.

52. (Previously Presented) The method according to claim 51, further comprising:

providing at least one passage in the sputtering electrode;

passing the plasma at least partly through the at least one passage of the at least one sputtering electrode to contact the plasma with the electrode.

53. (Previously Presented) The method according to claim 51, further comprising:

supplying the first deposition material outside the at least one plasma source into the processing chamber to the plasma in the processing chamber.

54. (Previously Presented) The method according to claim 51, further comprising:

supplying at least one volatile compound of the first deposition material to the plasma for the purpose of the deposition.

55. (Previously Presented) The method according to claim 54, wherein the volatile compound contains at least one precursor material which decomposes in the processing chamber in material to be deposited, before the material has reached the substrate.

56. (Previously Presented) The method according to claim 51, further comprising:

providing at least one second source chosen from the group consisting of a second plasma cascade source, a plasma source, a vapor deposition source and a sputtering source; and

depositing a third deposition material on the substrate with the second source.

57. (Previously Presented) The method according to claim 51, wherein said first or second deposition material comprises at least one catalyst material which, whether or not after an activation treatment such as a reducing step, is catalytically active.

58. (Previously Presented) The method according to claim 51, wherein said first or second deposition material comprises at least one carrier material, which material is inherently, or after a further treatment, suitable to carry catalyst material.

59. (Previously Presented) The method according to claim 57, wherein the at least one catalyst material and the at least one carrier material are deposited on the substrate by different sources.

60. (Previously Presented) The method according to claim 57, wherein the at least one sputtering electrode contains at least a part of both said catalyst material and said carrier material.

61. (Previously Presented) The method according to claim 60, wherein the sputtering electrode contains compressed powders of said materials to be deposited on the substrate.

62. (Previously Presented) The method according to claim 60, wherein the at least one sputtering electrode contains an alloy of said catalyst material and said carrier material.

63. (Previously Presented) The method according to claim 51, wherein the substrate comprises sheet material.

64. (Previously Presented) The method according to claim 51, wherein the substrate is moved in the processing chamber at least in such a way that each time a different part of the substrate makes contact with the plasma.

65. (Previously Presented) The method according to claim 51, wherein the substrate is brought from an environment into the processing chamber and is discharged from the processing chamber to the environment while the first deposition material is deposited on the substrate in the processing chamber.

66. (Previously Presented) The method according to claim 51, wherein the substrate is substantially non-porous.

67. (Previously Presented) The method according to claim 51, wherein the substrate comprises at least one carrier material.

68. (Previously Presented) The method according claim 51, wherein the substrate comprises at least one metal and/or alloy.

69. (Previously Presented) The method according to claim 51, wherein the substrate comprises Fecralloy.

70. (Previously Presented) The method according to claim 51, wherein the substrate comprises corrugated material.

71. (Previously Presented) The method according to claim 51, wherein the substrate is substantially porous.

72. (Previously Presented) The method according to claim 58, wherein said carrier material comprises a metal.

73. (Previously Presented) The method according to claim 58, wherein said carrier material comprises an oxidized metal.

74. (Previously Presented) The method according to claim 58, wherein said carrier material comprises a semiconductor.

75. (Previously Presented) The method according to claim 58, wherein said carrier material comprises an oxidized semiconductor.

76. (Previously Presented) The method according to claim 53, wherein the carrier material further contains a heat-conducting material.

77. (Previously Presented) The method according to claim 57, wherein the at least one catalyst material comprises or more of: nickel, copper, palladium, rhodium, platinum or iron.

78. (Previously Presented) The method according to claim 57, wherein the first or second deposition material is deposited such that the chemical composition of the deposited material measured over a distance of 20 cm differs by less than 10%.

79. (Previously Presented) The method according to claim 51, wherein reducing is carried out at an elevated temperature for the purpose of reduction of the deposited material on the substrate.

80. (Previously Presented) The method according to claim 79, wherein the reducing step is carried out under the influence of hydrogen.

81. (Previously Presented) The method according to claim 80, wherein inert gas and hydrogen, is supplied to the substrate for the purpose of the reduction.

82. (Previously Presented) The method according to claim 51, wherein the substrate is adjusted to a particular electrical potential, for instance by DC, pulsed DC and/or RF biasing.

83. (Previously Presented) The method according to claim 51, wherein the substrate is adjusted to a particular treatment temperature.

APPENDIX B

EVIDENCE APPENDIX

NONE

APPENDIX C

RELATED PROCEEDINGS APPENDIX

NONE